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being accomplished through the development of a validated objective criterion with which the Air Force can reliably evaluate the compatibility of an individual's ability or inability to successfully perform a selected set of well defined demanding task within a wide variety of Air Force career fields and jobs.

Physically demanding tasks within AFSCs have been identified through use of a survey administered by the AF Human Resources Laboratory. Starting with the most demanding AFSCs, working supervisors have been interviewed at bases throughout the continental United States and Alaska. Following the interview, a visit is made to the workplace to actual measurements of task demands. All AFSCs currently categorized as Factor-X one and most of the Factor-X two AFSCs have been field validated. Field interviews will be conducted for remaining AFSCs with physically demanding tasks. Sedentary AFSCs with no physically demanding tasks will not be surveyed beyond the questionnaire level.

Data collected during these base visits have been used to categorize the task demands of the AFSCs. The manual material handling activities of lift/lower, push/pull, carry, and hold accounted for 90 percent of the demanding activities. These activities have been subcategorized for performance measures into simulated tasks that are common across AFSCs. Laboratory tests have been conducted to relate performance on weight lifting tests to performance on lift, hold, push/pull and carry activities. The developed tests will be validated using an instrumented test van. During the van's base tour, data will be collected on approximately 800 incumbents.

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## SUMMARY

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Chief, Technical Information Division

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## INTRODUCTION

### OBJECTIVES

The primary objective of this project is to develop and validate an objective criterion with which the Air Force can reliably evaluate the compatibility of an individual's physical capacities with the physical demands of the various Air Force Specialty Codes (AFSCs). The validity of the criterion will be measured by the individual's ability, or inability, to successfully perform a selected set of well defined, significantly demanding tasks within an AFSC.

The methodology for accomplishing the objective is divided into several phases. Each of these phases and their interrelationships and interdependencies, as related to the development of the objective assignment criteria, is an inherent part of the technical effort to be performed.

Validation of the Initial Assignment Criterion is intended to demonstrate that an individual's strength and stamina assessments (measured by primary test battery) are within a small percent of the individual's strength and stamina assessments (measured by secondary test battery) and successfully predict an individual's capability to perform work requiring a specified level of demand.

Furthermore, validation of the Final Assignment Criterion should demonstrate that assignment tests can be used to classify individuals according to their ability to perform work with a certain level of demand. This method is designed to demonstrate that approximately 95 percent of the individuals successfully performing the tasks classified as requiring a certain level of demand can pass the test with a certain or larger strength requirements, and that approximately 95 percent of the individuals who have not performed successfully on tasks classified as requiring a certain level of demand cannot pass the tests with an equivalent or larger strength and stamina requirements.

The following is a summary description of the categories of activities and the key factors to be considered:

#### 1. Job Analysis

Perform a comprehensive job analysis encompassing the following activities:

- An operational definition of the levels of physical demands of tasks.

- A procedure for task analysis and quantification of those tasks which have significant physical demands.

Quantification of the demands of tasks which require significant physical demands.

Identification of well defined tasks which will be referred to as Performance Criteria Tasks (PCTs).

## 2. Translate Job Demands to Physical Capacities

Job demands will be translated to physical capacities by:

Identification of a battery of objective Strength/Stamina Aptitude Tests which can be used to accurately determine an individual's maximum safe physical capability to perform significantly demanding tasks as defined in the job analysis activities above.

A manual to describe the tests used in the battery, the procedures and equipment required in the administration of the tests, and use of resultant scores. These manuals can be used for training personnel prior to having them administer the test batteries.

The Strength/Stamina Aptitude tests will take into consideration the following factors:

Consistency with the strength and endurance values resulting from the initial task analyses and quantification.

Upper body strength, lower body strength, and whole body strength.

Present versus potential future physical condition, Armed Forces Entrance and Examining Station (AFEES) and Basic Military Training (BMT) schedule impacts.

Test administration in terms of equipment, time, and personnel.

## 3. Validation

The finalization and validation of assignment criteria will take into consideration the following factors:

An "assignment criterion" (both initial and final) that is to be used to evaluate the physical capacities of personnel to be enlisted and/or reassigned in order to predict success or non-success in heavy jobs.

Validation of the analysis of the Initial Assignment Criterion and subsequently the Final Assignment Criterion.

Documentation of the completed project which will include the Primary and Secondary Test Batteries and a test manual for each battery.



## MASTER PROGRAM SCHEDULE

The Master Program Schedule is shown in Table 1. This schedule depicts the major milestones to be accomplished within each category of program activities. For convenience, the activities are time-phased with reference to the three scales (calendar year, fiscal year, and months from go-ahead). This schedule has been revised to show the current status of the project in terms of completed, on-going, and projected activities.

This third annual report focuses primary attention on the significant accomplishments during the third year of the project. This is followed by a summary look into the expected future accomplishments for the remainder of the project.

## SIGNIFICANT ACCOMPLISHMENTS DURING YEAR 3

### FIELD VERIFICATION REVIEWS

The field verification review has been a major source of data for the project to date. A verification review basically consists of sending a team (2-4 members) of qualified civilians to preselected Air Force bases located throughout the United States. At each base visit, normally lasting one week, a formally coordinated and approved schedule is followed. First, a 1 1/2 hour interview is conducted with experienced supervisors and fully qualified airmen selected from various Air Force Specialty Code (AFSC) career fields. These interviews are conducted in appropriate interviewing facilities reserved by the Consolidated Base Personnel Office (CBPO) to ensure uninterrupted operations. The second phase of the review is a verification of the data collected and is conducted in the individual's work area.

#### Planning and Scheduling

Utilizing a variety of data available within the Air Force personnel system, such as preliminary strength and stamina surveys, percent participation of airmen performing tasks within each AFSC, and other general information pertaining to the organizational units and weapon systems located at each of the Air Force bases, an initial plan was developed to ensure optimization of the bases and AFSCs selected for the reviews. This resulted in meeting established objectives for the stratification of mission performance by major air commands, and variances in job requirements due to geographical factors and weapon systems.

The current "Airman Classification Structure Chart" (used in conjunction with AFR 39-1) serves as the project baseline for the total population of AFSCs to be quantified for physical demands. The 31 October 1981 structure chart lists a total of 226 AFSCs and 188 separately identifiable shredouts, plus an additional 30 "Special Identifier" AFSC's for an overall total of 434 AFSCs/Shredouts. Of this amount, approximately 20% are currently classified as Factor-X three AFSCs (i.e., basically administrative jobs requiring a low level of physical demands). The remaining 80% of the AFSCs, then, are all primary candidates for the verification review process. A priority approach was

Table 1. Master Program Schedule

PROJECT ACTIVITY	Calendar Year	1978			1979											
	Fiscal Year				FY 1979											
	Month	O	N	D	J	F	M	A	M	J	J	A	S			
<u>JOB ANALYSIS</u>																
• Assemble Task Lists for 240 AFSCs																
• Develop Survey Questionnaire to Identify AFSC Tasks Requiring Significant Physical Demands																
• Modify Survey Plan (Two Questionnaires)																
• Administer Questionnaire 1																
• Develop Questionnaire 2																
• Identify Requirements for Questionnaire 2																
• Conduct Sample Survey of Questionnaire 2																
• Refine Questionnaire 2																
• Analyze Questionnaire 1 Data																
• Develop Sampling Scheme for Selecting Task Lists for Questionnaire 2																
• Select Tasks/AFSC to be used in Quest. 2 (Wave 1)																
• Validate Tasks Selected for Quest. 2 (Wave 1)																
• Finalize Tasks Selected for Quest. 2 (Wave 1)																
• Identify Interface with PROMIS Program																
• Perform Hazard Analysis & Procure Test Equipment for Task Quantification																

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**Table 1. Master Program Schedule (cont.)**

PROJECT ACTIVITY	Calendar Year	1981											
	Fiscal Year	FY '81											
	Month	O	N	D	J	F	M	A	M	J	J	A	S
<u>JOB ANALYSIS</u>													
.Field Data Collection													-----X
.Revision of Data Handling Procedure													X--X
.Field Data Analysis													-----
.Preliminary AFEEES and BMT Schedule Analysis													X----X
<u>TRANSLATE JOB DEMANDS INTO PHYSICAL CAPACITIES</u>													
.Development of Simulated Tasks													X-----
.Identification of Candidate Tests for Battery													X-----
<u>VALIDATION OF ASSIGNMENT CRITERION</u>													
.Development of Field Validation Protocol													X-----X
.Development of Incumbant Sampling Plan													X-----X
.Preparation for Base Validation Trips													X-----

PROJECT ACTIVITY	Calendar Year													
	1981	1982												
	Fiscal Year	FY '82											'83	
	Month	O	N	D	J	F	M	A	M	J	J	A	S	O
<u>JOB ANALYSIS</u>														
.Field Data Collection														
.Field Data Analysis														
.Final AFEES and BMT Schedule Analysis														
<u>TRANSLATE JOB DEMANDS INTO PHYSICAL CAPACITIES</u>														
.Development of Simulated Tasks														
.Identification of Candidate Tests for Battery														
<u>VALIDATION OF ASSIGNMENT CRITERION</u>														
.Preparation for Base Validation Trips														
.Travel to Bases for Validation														
.Analysis of Validation Data														
.Development of Final Assignment Criterion														
.Documentation of Primary and Secondary Test Batteries and Their Administrative Procedures														
<u>FINAL REPORT</u>														

taken to evaluate Factor-X one AFSCs first and then the Factor-X two AFSCs. An initial plan was developed which identified the bases to be visited and the number of supervisors to be interviewed by AFSC. In those cases where the jobs reflected by AFSC shredouts are uniquely different due to the different weapon systems involved, each shredout was treated as if it were a separate AFSC. For planning purposes, each AFSC (or applicable shredout) was scheduled for four supervisor interviews as a minimum.

Figure 1 is an illustration of the Verification Review Plan, reflecting updated status of the plan after each base visit. The assigned "K-number" in column 1 is an internal cross-reference number and has no significance to the reader. Columns 2 and 3 identify the Air Force designated AFSC number and title (by AFSC shredout where applicable). Columns 4-6 reflect the current status of interviews for each AFSC. Initially, each AFSC was scheduled for a minimum of four interviews (Col. 5, Interviews Remaining): the number of interviews scheduled by trip number (circled) were then planned out.

Upon completion of a base visit, the number of actual interviews conducted is posted in Col. 4 with a corresponding strike out of the trip number in Col. 6. An estimate of the remaining number of interviews required is then entered in Col. 5 and updated with its proper trip number in Col. 6. Since a separate task list is used for each AFSC interviewed, Col. 7 identifies, by checkmark, that a Task List has been completed and is available for use. Lastly, when the AFSC has been evaluated for completeness, an audited worksheet accomplished, and the data is loaded into the computer, the last column is checked, indicating the AFSC is closed out for the purposes of data collection requirements. Every AFSC is planned, and tracked in a similar manner to ensure proper overall project visibility.

#### Verification Review Procedures

Appendix A contains a copy of the latest written procedures that are used in conducting verification review interviews, validating data in the working areas, and other pertinent procedures for closing out an AFSC in the terms of the data collection process. The procedures provide sample illustrations of the forms used with typical data. Formal authorization and control of those procedures is maintained to ensure proper documentation control.

Once sufficient data are collected for an AFSC to be closed out, a summary sheet is accomplished and filed with the full documentation for the AFSC.

Appendix B contains a sample of the required summary and a Frequency Distribution Chart on the predominant activity for the AFSC as stated by the supervisors interviewed. This chart depicts the number of actual weights verified for objects lifted/lowered plus the frequency of estimated weights of objects obtained in the interviews with supervisors.

Figure 1. VERIFICATION REVIEWS: PLANNED SCHEDULE & STATUS

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K# (Col. 1)	AFSC (Col. 2)	Title (Col. 3)	Status of Interviews (Thru Trip # 38)			Task List (Col. 7)	Interval Comp. (Col. 8)	Closed Out (Col. 9)
			Complete (Col. 4)	Remaining (Col. 5)	# Planned / On Trip # (Col. 6)			
112	306XO	Elect. Comm. & Crypto Equip. Sys	6	0	2(21), 2(21), 2(24), 2(35)	✓	✓	✓
162	306X1	Elect. Mech. Comm. & Crypto Equip. Sys	5	0	2(24), 2(31), 2(32), 2(35)	✓	✓	✓
113	306X2	Telecomm. Sys./Equip. Maint.	7	0	2(21), 2(31), 2(32), 2(37), 2(38)	✓	✓	✓
114	307XO	Telecomm. Sys. Control	5	0	2(24), 2(31), 2(37)	✓	✓	✓
115	308XO	Space Sys Equip.	0	4	2(44), 2(46)	✓	✓	✓
118	321X2*	Weapon Control Systems						
	A	F-106 A/B (MA-1, ASQ-25 Sys)	0	2	2(42)	✓		
	C	F-106 A/B (MA-1, ASQ-25 Subsys)	0	1	2(42)	✓		
	P	F-4 CD (APQ-109/APA-165)	1	1	1(30)	✓		
	Q	F-4E (APQ-120)	0	2	2(43)			
15	322X2	Avionics Sensor Sys						
	A	Recon Electronic Sensors	2	0	2(21), 2(44)	✓	✓	✓
	B	Tac/Real Time Display Elect Sensors	4	0	2(20), 2(21), 2(24)	✓	✓	✓
	C	Electro-optical Sensors	3	0	1(17), 2(24), 2(20)	✓	✓	✓
119	324XO	Precision Measuring Equip	7	0	2(22), 2(25), 2(26), 2(41)	✓	✓	✓
120	325XO	Auto Flt. Con. Sys	5	0	2(26), 2(21), 2(20)	✓	✓	✓
57	325X1	Avionics Instrum. Sys	6	0	2(24), 2(26), 2(41), 2(47), 2(48)	✓	✓	✓

### Preliminary Evaluation of Field Verification Data

Although data collection is not completed yet, there are some preliminary assessments that can be made on the information gathered from the verification reviews as of this reporting data. Figures 2 and 3 show that a total of 713 personnel have been interviewed on the 37 base visits conducted and an estimated 67 AFSCs have been closed out or will be when administrative paperwork is completed. These cumulative accomplishments through fiscal year 1981 compare favorably to the commitments made early in the year for an accelerated project schedule. These accomplishments are attributed to the increased manpower applied to the project, a higher degree of efficiency obtained from those resources, and a conscientious effort to place a high priority on data collection for the last four months of the fiscal year. No verification review trips are planned for the month of October in order to work-off the backlog of administrative paperwork. As such, the figure of 67 AFSCs completed at the end of September is a conservative estimate. The vast majority of AFSCs currently classified as Factor-X one have been completed and a substantial number of Factor-X two AFSCs are nearing the completion status.

Table 2 is a summary of the 713 supervisors interviewed by grade and major command of assignment. The average grade of E-6, Tech Sergeant coincides with the targeted grade established at the outset of the project. The average years of experience working in the AFSC (10 1/2 years) is a good indicator of the total experience possessed by the personnel interviewed. The balance of first-term airmen, on the lower end of the spectrum and the expertise reflected by the "super-grade" NCO's at the other end have provided a more complete picture of the varying perspectives and viewpoints. In addition, a representative stratification of major command of assignment has been obtained and will be most beneficial in the analysis of the data collected, especially in terms of variance in mission performance and weapon systems involved.

Table 3 is a summary of some of the pertinent data for the most physically demanding AFSC's (X-1 classification). The overall consensus of the 145 supervisors interviewed indicates that lift/lower is the predominant activity with the push/pull and carry following in that order. As might be expected, the personnel interviewed indicated that endurance was also a significant factor in many of these most physically demanding AFSCs (as indicated by the check mark in the yes column). Of the supervisors interviewed for each AFSC, the average number of the tasks identified during the interview to require endurance is recorded in the last column of the chart. For example, the consensus of nine supervisors interviewed for AFSC 921X0 (Survival Training) was that an average of 11 1/2 of the 25 representative tasks selected for their AFSC involved some form of local or whole body endurance. For the other AFSCs shown, an arbitrary figure of six tasks was used to identify endurance as a significant added consideration; less than six tasks are annotated with a check mark in the "No" column.

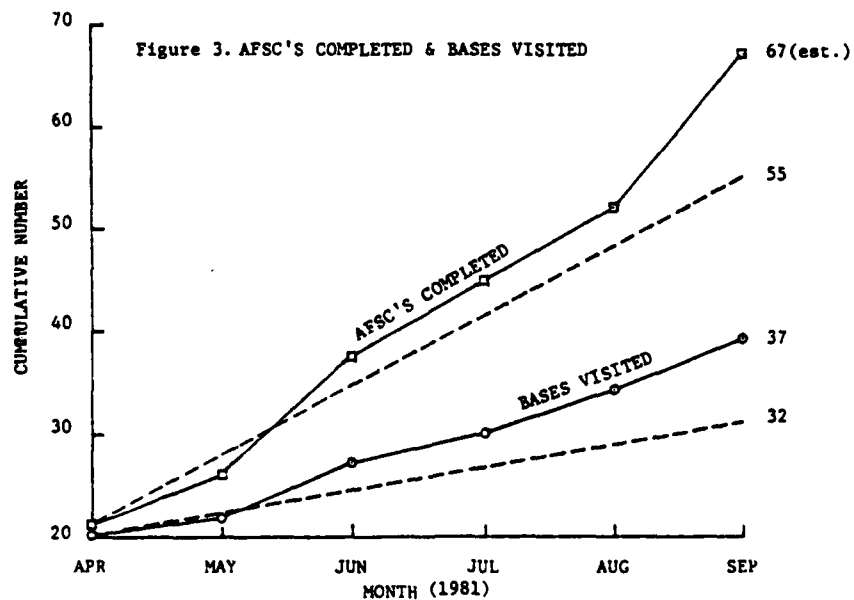
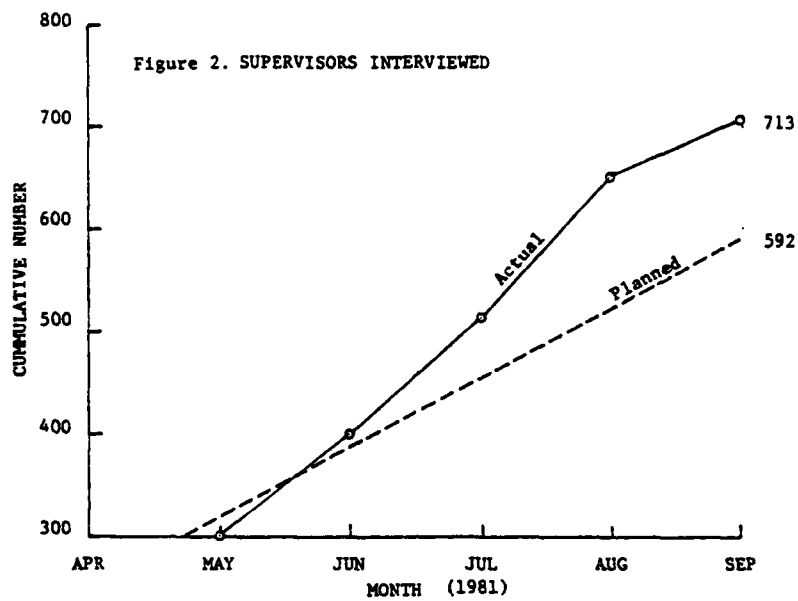


TABLE 2. Supervisors Interviewed (by Grade & Majcom)

SUPERVISORS INTERVIEWED (BY GRADE & MAJCOM)

<u>Grade</u>	<u>#</u>	<u>SAC</u>	<u>MAC</u>	<u>TAC</u>	<u>AFLC</u>	<u>AFSC</u>	<u>ATC</u>	<u>OTHER</u>
E-9 CMS	12	1	8	1			1	1
E-8 SMS	27	5	13	5	1		1	2
E-7 MSG	138	30	30	32	12	5	11	18
E-6 TSG	239	78	46	54	10	8	13	30
E-5 SSG	211	44	43	63	19	6	5	31
E-4 SGT & Lower	83 <u>3</u>	16 <u>2</u>	18 <u>—</u>	25 <u>—</u>	7 <u>—</u>	1 <u>—</u>	10 <u>1</u>	6 <u>—</u>
	713	176	158	180	49	20	42	88

Average Grade: E-6, TSG ... Average Years Experience in AFSC: 10 1/2 years



TABLE 3. Summary of Top-20 AFSCs (Most Physically Demanding)

AFSC	TITLE	# SIJPV's INTVW	Activity			Endurance		
			1st	2nd	3rd	Yes	No	Avg # Tasks
115X0	Pararescue/Recovery	5	C	LL	HP	X		18
316X1	Missile Systems Maint.	7	LL	C	PP		X	2
316X2	Missile Electronic Equip.	10	LL	C	PP	X		7
328X2	Electronic Warfare Sys.	4	LL	C	PP		X	4.5
361X0	Cable & Antenna Install							
	Maint.	4	PP	LL	C	X		15
361X1	Cable Splice Install &							
	Maint.	5	PP	LL	C	X		12
423X2	Aircraft Egress Systems	5	LL	PP	HP		X	5.5
431X0	Helicopter Maint.	10	LL	PP	C	X		8.5
431X1	Tactical A/C Maint.	14	LL	PP	HP	X		8
431X2	Airt/Bomb A/C Maint.	22	LL	PP	C		X	5
443X0	Missile Maint.	10	PP	LL	C		X	5.75
443X1	Missile Pseudraulic							
	Repair	3	LL	PP	C	X		7.5
445X1	Msl. Liquid Propellant							
	System Maint.	4	LL	C	PP	X		9
542X1	Electrical Power Line	6	CLI	PP	LL	X		8.5
545X0	Refrigeration and							
	Cryogenics	6	LL	PP	C	X		6
545X2	Heating Systems	6	LL	C	PP	X		9.5
551X0	Pavements Maint.	6	LL	C	PP	X		16
551X1	Construction Equipment	5	LL	PP	HP		X	5.5
571X0	Fire Protection	4	LL	C	PP	X		10
921X0	Survival Training	9	C	LL	PP	X		11.5
TOTAL		145	LL	PP	C	14	6	9

Recognizing that although all of the data for these selected AFSCs has not been tabulated (from the most recent base visits), this summary still represents about 500 tasks measured and over 5000 activity/task combinations measured for the family of objects related to the performance of these jobs. In a majority of cases, actual weights and forces have been obtained through verification of data in the work areas and other sources such as tech orders, standard publications and specifications when available.

In general, the estimates provided by personnel interviewed show the best correlation to actuals for the lift/lower activity. Personnel working in AFSCs where extensive use of tech orders is a normal part of their daily work generally provided the best estimates for lift/lower activities; the avionics family of AFSCs are typical.

There is a marked difference in the correlation of push/pull estimated forces to actuals. The average airman found it much more difficult to estimate the pounds of force required to push/pull an object. Furthermore, only a small percentage of personnel interviewed could accurately perceive the force required for turn/torque activities, the exception would be personnel performing in an AFSC like 324X0, (Precision Measuring Equipment) where torque measurements are common place in the normal work routine.

Much of the success of the verification reviews conducted to date must be credited to the outstanding support received from all Air Force personnel associated with the effort the technical monitor's office for coordinating all base visits; the project representatives from the Air Force Personnel Center (MPCRPO) for their timely response on numerous informational requests and their helpful guidance; the CRPO representative at each base for their efficient scheduling of interviews and facilities; and, most important, all of the Air Force personnel interviewed for their professional support. All displayed a great interest in the project and provided invaluable assistance.

#### DEVELOPMENT OF ASSIGNMENT CRITERION

##### Analytical Data Base

A new computer file record layout has been defined for recording a portion of the field interview data for use in the development of the assignment criterion. The new file structure was required in order to accommodate new data structures being obtained from improved interview procedures in the field. The new file layout contains only a single record format and fewer data items. A copy of the new, abbreviated file structure and layout are shown in Table 4. In addition, a sample printout of the file contents is given in Figure 4.

In the process of computer file definition to incorporate the improved field procedures, it was decided to simultaneously incorporate a more concise scope of purpose for the computer file. The scope of use

TABLE 4. Structure of Computerized Data File

<u>Field</u>	<u>Contents</u>
1-4	K-NUMBER
6-11	AFSC
13-14	TASK
16-18	Activity/Range (Coded)
20-53	OBJECT
55-56	Simulated Task (Coded)
58-60	Actual Force
62-64	Est'd. Force
66	Activity (Uncoded)
68-69	Range (Uncoded)
71-73	AFSC Line No.

Figure 4. SAMPLE PRINTOUT OF COMPUTERIZED FILE CONTENTS

12P 316X1L W	CAR GUIDANCE SECTION (AGM-45)	C4	43	84
12P 316X1L Z1	P/P MUNITION TRAILER W/MISSILE COMP.	P3	67	85
12P 316X1L Z2	LFK AGM-65 COMPONENT	L6	67	86
12P 316X1L Z2	P/P AGM-65 COMPONENT	P3	75	87
12P 316X1L Z2	CAR AGM-65 COMPONENT	C3	67	88
12P 316X1L Z3	LFK GUIDANCE UNIT (AIM-7)	L6	75	89
12P 316X1L Z3	P/P GUIDANCE UNIT (AIM-7)	P3		90
12P 316X1L Z3	T/T GUIDANCE UNIT (AIM-7)	**		91
12P 316X1L Z3	MPK GUIDANCE UNIT (AIM-7)	H1	75	92
12P 316X1L Z4	P/P AGM-65 MISSILE ON TRUCK	**		93
12P 316X1L Z5	OTH MHU-83 BOMB LIFT TRUCK	**		94
12P 316X1L Z6	LFK UMBILICAL TEST SET	L6	45	95
12P 316X1L Z6	CAR UMBILICAL TEST SET	C4	45	96
12P 316X1L Z7	P/P G150 TEST CONSOLE (WT 1630)	P3	63	97
12P 316X1L Z8	LFS TOOL BOX (FOR DRONE MTN.)	L2	32	98
12P 316X1L Z8	CAR TOOL BOX (FOR DRONE MTN.)	C2	32	99
12P 316X1L Z9	LFS 829G INSTR. CALIBRATN EQUIP	L7	49	100
12P 316X1L Z9	CAR 829G INSTR. CALIBRATN EQUIP	C3	49	101
163 316X0T A	LFK MISSILE SIMULATOR	L6	56	1
163 316X0T B	LFK MISSILE SIMULATOR	L6	56	2
163 316X0T C	LFR PROCESSOR DIST. UNIT	L9	38	3
163 316X0T D	LFK DIGITAL DATA INSERTER (AN/AJQ-22A)	L6	46	4
163 316X0T E	LFK DIGITAL DATA INSERTER (AN/AJQ-22A)	L6	46	5
163 316X0T E	LFK SCORING DATA PRINTER SET	L6	40	6
163 316X0T G	LFK DIGITAL DATA INSERTER (AN/AJQ-22A)	L6	46	7
163 316X0T H	LFK DIGITAL DATA INSERTER (AN/AJQ-22A)	L6	46	8
163 316X0T I	P/P MA-3 AIR COND. AGE, 4 WHEELS	P5	86	9
163 316X0T J	S/D SHOVEL - (SNOW AND ICE)	**		10
163 316X0T N	LFR FAN (INSTALLATION) - B-52/G/H	L9	28	11
163 316X0T N	HPR FAN (INSTALLATION) - B-52/G/H	H4	28	12
163 316X0T P	LFK MISSILE SIMULATOR (AN/AWM-40A)	L6	56	13
163 316X0T Q	LFR FAN - B52/G/H (INSTALLATION)	L9	28	14
163 316X0T Q	HPR FAN - B52/G/H (INSTALLATION)	H4	28	15
163 316X0T R	LFK PROCESSOR DIST. UNIT	L6	38	16
163 316X0T S	P/P N2 BOTTLE	P4	37	17
163 316X0T S	LFK N2 BOTTLE	L6	73	18
163 316X0T T	LFR FAN - B52-G/H (INSTALLATION)	L9	28	19
163 316X0T T	HPR FAN - B52-G/H (INSTALLATION)	H4	28	20
163 316X0T U	LFR PROCESSOR DIST. UNIT	L9	38	21
163 316X0T V	LFK CONTROL GUIDANCE UNIT	L6	12	22
163 316X0T W	T/T GUIDANCE ASSEMBLY	**		23
163 316X0T W	P/P GUIDANCE ASSEMBLY	P2		24
163 316X0T X	LFK MISSILE BATTERY	L6	25	25
163 316X0T Y	CAR WEED EATER W/SHOULDER STRAP	C6	27	26
163 316X0T Z1	LFR FAN - B52-G/H (INSTALLATION)	L9	28	27
163 316X0T Z1	HPR FAN - B52-G/H (INSTALLATION)	H4	28	28

for the new computer file is predominately that of analytical modeling. It was determined to be impractical to continue trying to use the computer file as a master reference repository for most of the field interview data. The field interview data master reference repository is now in the form of manual paperwork, in order to accommodate the dispersive evolution of field data recording methods and procedures.

Implementation of some of the preliminary analytical procedures (model) for processing the analytical data base has begun. The laboratory-based linear least squares equations are being used convert the various kinds of biomechanical job demands to a more parsimoniously dimensioned measurement (hopefully univariate), in order to obtain universally comparable measures of biomechanical job demand regardless of AFSC, task, resistance type, or root biomechanical activity or posture.

The principle remaining tasks associated with the analytical data base are to (1) continue loading the remainder of analytical model data from field interviews into the data base, and (2) to incorporate the remaining linear least squares weight-machine prediction equations.

#### Development of Simulated Tasks

Data collected during the base visits have been used to categorize the task demands of the AFSCs. Manual material handling activities, i.e., lift/lower, push/pull, carry, and hold, account for 90 percent of the demanding activities. These activities have been subcategorized for performance measures into simulated tasks that are common across AFSCs. These simulated tasks are derived from and consistent with the variable definitions for the task demand analysis. In this way, the range of movement, type of movement, rate, frequency, and other parameters are comparable for task demand and individuals' performance. The simulated tasks developed to date are shown in Figure 5 through 8.

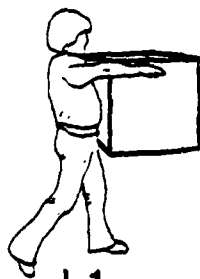
#### Identification of Candidate Tests for Battery

The majority of the manual materials handling activities associated with demanding tasks involve lifting activities. These tasks include requirements for muscular strength and/or endurance. To reflect these requirements, lifting tests were developed which measure both strength and endurance using an incremental weight lifting machine. This machine has a range of movement from one foot above the floor to seven feet. The weight may be selected in 10 pound increments over a range of 40 to 200 pounds.

A laboratory study was conducted at Texas Tech University to obtain comparison data between the simulated tasks and the lifting tests. Seventy students (age 18-21) served as research subjects for the development and testing of the proposed simulated tasks and lifting machine tests. Regression analyses were made between the simulated tasks and the lifting machine test scores. The  $R^2$  values ranged from .45 to .92.

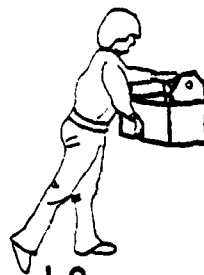
Based on these results, simulated tasks and machine tests to be performed by a group of incumbents will be selected. Consideration will be given to the correlation of the simulated tasks to the

Figure 5. SIMULATED TASKS FOR LIFT ACTIVITIES



L1

LIFT F-4B  
25. OBJECT 4/HANDLES



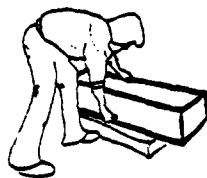
L2

LIFT TOOL BOX F-4B  
1- HAND



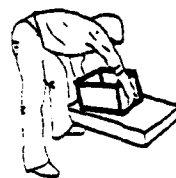
L3

LIFT TOOL BOX F-4B  
2-HAND



L4

LIFT ORLONG OBJECT  
F-PALLET



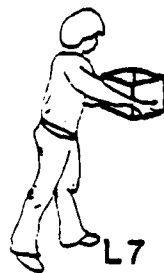
L5

LIFT REGULAR BOX  
F-PALLET



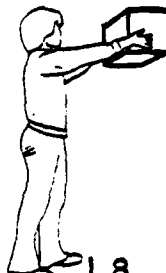
L6

LIFT REGULAR BOX F-R



L7

LIFT REGULAR OBJECT  
F-4B



L8

LIFT REGULAR OBJECT  
F-3



L9

LIFT REGULAR OBJECT  
F-4' (F-2)

Figure 6. SIMULATED TASKS FOR PUSH/PULL ACTIVITIES

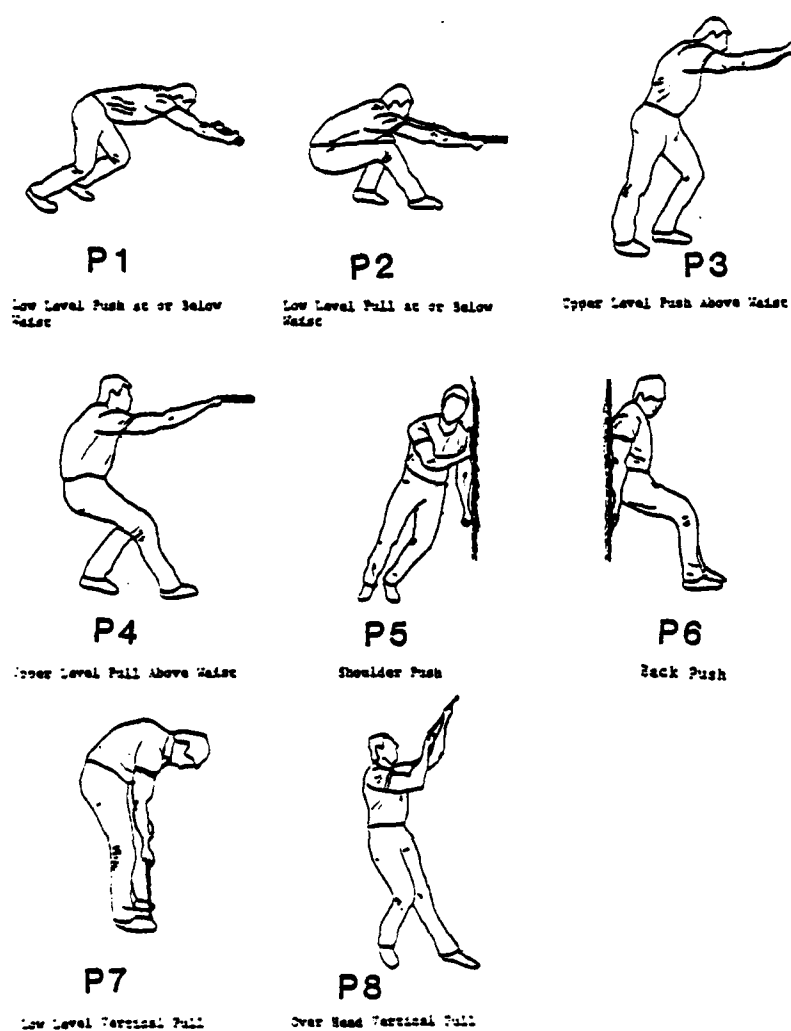


Figure 7. SIMULATED TASKS FOR CARRY ACTIVITIES

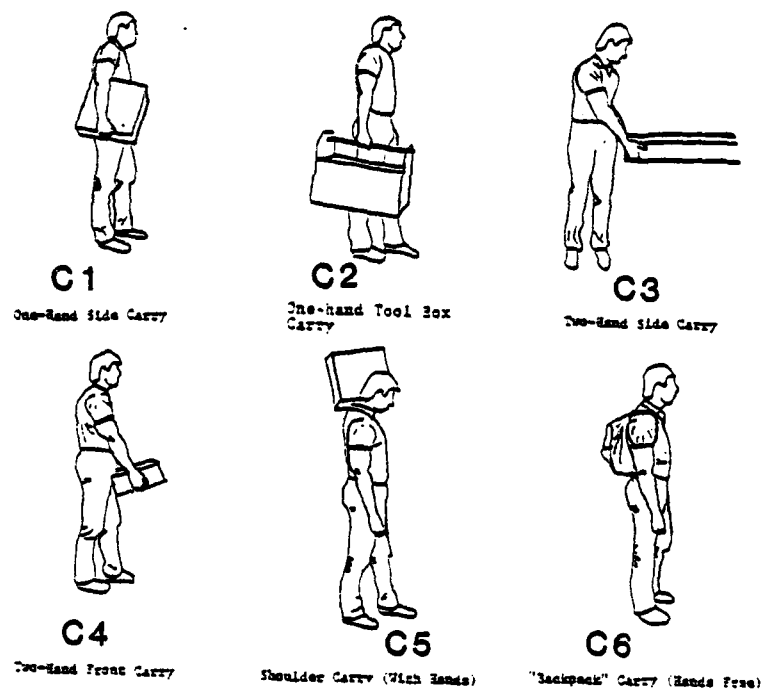
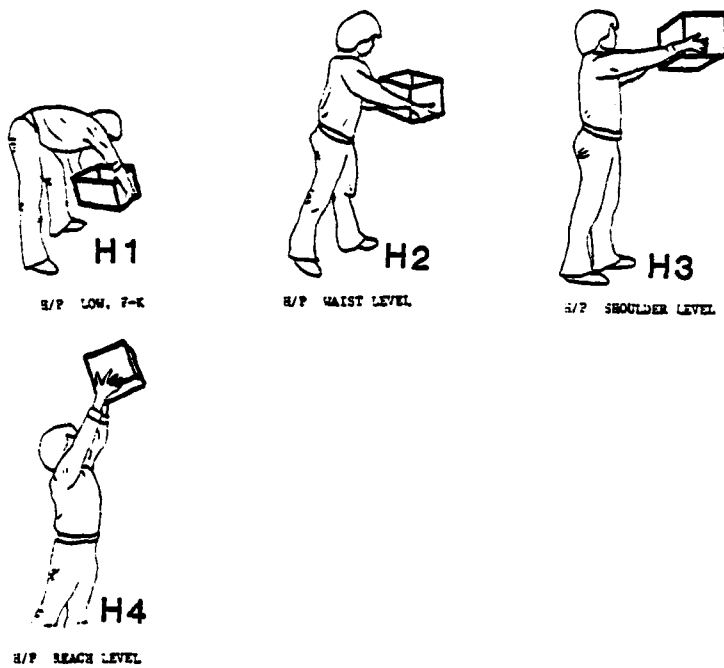




Figure 8. SIMULATED TASKS FOR HOLD ACTIVITIES



machine tests and to each other in reducing the number of simulated tasks and machine tests to be used during the base testing. The tests include:

1. an incremental lift to six feet to establish a maximum,
2. a repetitative lift to six feet of a weight equal to the maximum minus 10 pounds,
3. a 70 pound hold at elbow height, and
4. an incremental lift to knuckle height.

The first test reflects total body strength; the second, whole body endurance; the third, upper arm strength; and the fourth, leg strength.

#### Incumbent Sampling Plan

The field data necessary for constructing the final test battery is to be obtained by testing incumbents at 10 to 12 bases which have been visited for on-site interviews. Each incumbent will be tested on the simulated tasks and the lifeing machine tests. Proposed AFSCs to be covered include almost all Factor-X one AFSCs and many of the Factor-X two AFSCs. A total of 800 subjects will be tested. It is anticipated that the sample will reflect the current mixture of males and females performing in the selected AFSCs. The sample size indicated allows for studying the variation among incumbents within/between bases and also within/between AFSCs. Furthermore, this sample size should also allow a factor analysis to be done within appropriate subsets of incumbents. The number of incumbents to be tested may be reduced upon examination of the incoming data as it is obtained.

#### Preparation for Base Validation Trips

Travel to Air Force bases for collection of validation data will be made in a specially outfitted van. A van that can be dedicated for this purpose has been obtained. It will be used to carry the weight lifting machine and necessary equipment for the simulated tasks. Present plans are for it to be parked in a hanger area during the base visit. In this way, some of the equipment for the simulated tasks can be mounted on it, thus making it easier to set up and administer the testing. Appropriate planning and modifications for this are currently being done. Necessary proposals for the protection of human subjects will be prepared and submitted to the appropriate review committees for Texas Tech and the Air Force. The presently scheduled bases for the validation are listed by major command in Table 5 and illustrated on a map in Figure 9.

#### OTHER ACTIVITIES

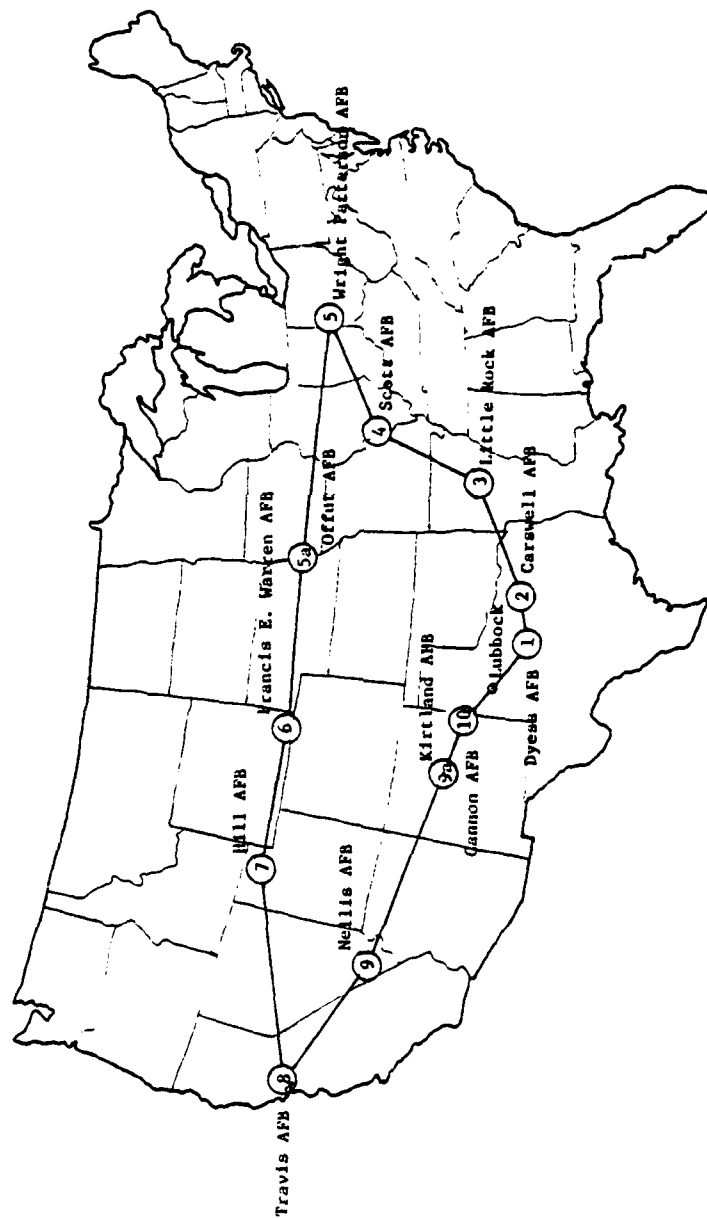
On 27-28 August 1981, a tri-service workshop was held at AFAMRL. The objective of this workshop was to exchange methods and data concerning (a) the analysis of the physical demands of military jobs, (b) physical strength and endurance data relevant to military personnel, (c) comparisons of performance on physical tests with performance in physically demanding jobs, (d) safety, reliability, maintainability, and cost considerations for strength testing equipment.

TABLE 5. Van Validation Schedule

Trip	Base/Location	MAJCOM
1	Dyess AFB Abilene, TX	SAC
2	Carswell AFB Ft. Worth, TX	SAC
3	Little Rock AFB Little Rock, AR	SAC
4	Scott AFB Belleville, IL	MAC/ AFCC
5	Wright-Patterson AFB Dayton, OH	AFLC
6	F.E. Warren AFB Cheyenne, WY	SAC
7	Hill AFB Ogden, UT	AFLC/ TAC
8	Travis AFB Fairfield, CA	MAC
9	Nellis AFB Las Vegas, NV	TAC
9*	Kirtland AFB Albuquerque, NM	MAC/ AFSC
10	Cannon AFB Clovis, NM	TAC

\*Alternate Base

Figure 9. Van Route for Base Validation Visits



The attendees of this workshop were scientists representing military research organizations and military contractors who are currently working toward establishing physical standards for military jobs. The attendees concluded that the workshop was of great value to the participants and that sufficient work remains to justify one or two additional workshops in the near future. A tri-service program was considered feasible and the program managers for the three services will continue to work toward that end. Future interface meetings should be equally useful as evidenced by the many common jobs among the military services shown in Appendix C.

### FUTURE ACTIVITIES

The Master Program Schedule shows the activities to be performed to achieve the project objectives. This schedule reflects the changes that have been made to the original time table during the course of this project. During year 4, the work on the project will be completed and the final assignment criterion established and documented.

The major categories of effort and their steps to be performed to complete the project are summarized below.

#### Job Analysis

The objective is the analysis of Air Force tasks requiring significant physical demands. The steps to be completed are:

1. Task analysis of remaining AFSCs to identify physically demanding tasks,
2. AFSC task quantification in physical units, and
3. AFEES and BMT analysis.

#### Translate Job Demands and Physical Capacities

This phase is concerned with the development of appropriate candidate tests. The steps to be completed are:

1. Analysis of appropriate field verification data,
2. Development of appropriate simulated tasks, and
3. Identification of additional candidate tests.

#### Validation of Assignment Criterion

This phase will be concerned with the selection, finalization, and testing of the assignment criterion. The steps to be completed are:

1. Final preparation for base validation trips,
2. Collection of validation data at bases,
3. Analysis of validation data,
4. Development of final assignment criterion, and
5. Documentation of primary and secondary test batteries and their administrative procedures.

APPENDIX A

VERIFICATION REVIEW PROCEDURES

VERIFICATION REVIEW PROCEDURES  
ESTABLISHING CRITERIA FOR ASSIGNING  
PERSONNEL TO AIR FORCE JOBS

CONTENTS

- A. Interview
- B. Questions/Prompts
- C. Completing the Interview
- D. Verification
- E. Post Trip
- F. Final Audit and Close-Out of AFSC
- G. Verification Review Trip Preparation

ATTACHMENTS

- A. Instructions for Ranking Tasks on Task List
- B. Ranked Task List
- C. Interview Information Legend
- D. Simulated Task Information
- E. Interview Sheets (2)
- F. Worksheet
- G. Interview and Verification Assignment Schedule
- H. Supervisor Roster
- I. Trip Schedule Sheet
- J. Contents of Trip Kit
- K. General Information

VERIFICATION REVIEW PROCEDURES

A. INTERVIEW

1. Fill out the heading of the Interview Sheet.
  - \*MAJCOM-Major Command
    - TAC, SAC, MAC, AFLC, AFSC, AFCC, ATC, AAC, PACAF
  - \*Get the exact AFSC (Air Force Specialty Code).
    - Qualification level
    - Applicable shread out and/or prefix
    - Current duty title
  - \*Yrs. Exp. - years experience in AFSC.
    - Round fractions up
  - \*Current X-Factor (Physical Profile Serial Factor "X").
2. State the purpose of the interview.
  - \*To develop an effective X-Factor test, given at AFEES, which will assess the physical capacity of entering airmen.
  - \*To quantify the physical (strength/stamina) demands associated with each of selected AFSC career fields.
3. State the primary sources of data.
  - \*A survey/questionnaire to approximately 20 experienced supervisors in each AFSC.
  - \*A personal interview with approximately 5 experienced supervisors in each AFSC.
    - Emphasize this source as the most important of the two.
4. Provide the supervisor with Instructions for Ranking Tasks On Task List.
  - \*Read the Instructions for Ranking Tasks on Task List aloud to the supervisor while he reads his copy.
  - \*Make certain he understands physical demand includes strength and/or endurance.
5. Provide the supervisor with a task list.
  - \*Have the supervisor scan the task list for familiarity.
6. Have the supervisor rank the tasks he has performed in the task list according to physical demand (1 - Highest--25 - Lowest).
  - \*Indicate it is permissible to use NA (not applicable) for a task(s) he has not performed or is no longer required of airmen in AFSC.
7. Ask the supervisor to return the ranked task list to you.
  - \*Transcribe his ranking of the task list to your Interview Sheet (or copy in order as you question/interview).
8. Have the supervisor become familiar with the format of the information required.
  - \*You may provide a copy of an Interview Sheet for reference/comments.
  - \*Review the Interview Information Legend with him.



\*Note the range/level breakout required on Lift/Lower and Hold/Position.

•Floor, pallet, knuckle, waist/workbench, shoulder, reach

9. Make certain the supervisor understands he is to draw on all experience in AFSC.
10. Begin questioning/interviewing the supervisor with the task he ranked number one.  
\*Take time on this first task to insure proper understanding of the quality and quantity of information required.
11. Proceed questioning/interviewing the supervisor with the remaining tasks he ranked.  
\*Abbreviated questioning (prompting) can be used once he understands what information is required.

#### B. QUESTIONS/PROMPTS

1. [Primary Activity]  
\*Which activity is the most physically demanding in performing this task?  
•For L/L - What is the start and finish levels?  
•For H/P - What level is the object(s) held/positioned?  
\*Record the activity as coded on the Interview Information Legend.
2. [Object Description]  
\*Give a discrete description of the object(s) involved.  
\*Record the name (technical name and specification number, if possible), dimensions, weapons system, etc.
3. [Normal Posture]  
\*What is the normal posture(s) for performing this activity?  
\*Record the posture/posture combination as coded on the Interview Information Legend.
4. [Simulated Tasks]  
\*Identify an applicable Simulated Task.  
\*Record as coded on Simulated Task Information.  
\*If no Simulated Task is applicable, record an asterick (\*).
5. [Comments]  
\*Comment on any peculiar aspect(s) of this activity such as odd positions, confined working space, etc.  
\*Record same and any other descriptive narrative.
6. [Estimated Weight]  
\*Estimate the weight of the object(s) or the force required to perform this activity.  
\*How many people are normally used to perform this activity?  
\*Record the estimated weight; divided by the number of people; equals individuals' share.

7. [Frequency]
  - \*How frequently is this task performed by first term airmen?
  - \*Record as coded on the Interview Information Legend.
8. [% Participation]
  - \*What percent of first term airmen perform this task?
  - \*Record same.
9. [Strength/Endurance]
  - \*Does the performance of this task require predominantly strength, endurance or both?
    - For E - Is it L (local) or W (whole body) endurance?
  - \*Record the endurance as coded on the Interview Information Legend.
10. [Other Activity]
  - \*Is there a significant other activity involved in performing this task?
    - Repeat the questions/prompts outlined until there are no significant other activities.
    - Frequency, % participation and strength/endurance information required for the task as a whole only.
11. Repeat the questions/prompts outlined until the task list is expired.

#### C. COMPLETING THE INTERVIEW

1. Ask the supervisor if there is any physically demanding task(s), not on the task list, he would have ranked in the top five.
  - \*Designate as Z Task(s) - Z1, Z2, Z3, etc.
  - \*Record a discrete description of the task on the task sheet.
  - \*Indicate the position the supervisor would have ranked it.
  - \*Repeat the questions/prompts outlined for each Z task.
2. Ask the supervisor which physically demanding tasks are critical to the successful performance of an airman entering this AFSC.
  - \*Circle a maximum of five of the critical task letters on the Interview Task Sheet.
3. Remarks Section
  - \*Experiences working with females or weak males.
  - \*Impact factors such as climate, availability of handling equipment, work schedule, etc.
  - \*Experiences with job related injuries.
  - \*Special conditioning or exercise requirements.
  - \*Other bases to interview supervisors in this AFSC.
  - \*Any other pertinent information.
4. Ask the supervisor for building number, contact name, telephone number, and schedule a verification in the work area.
  - \*Encourage the supervisor to be present.
5. Ask the supervisor to have a copy of pertinent tech orders (weight sections only) available when you get to the work area.

#### D. VERIFICATION

1. Report for verification in the work area at the designated time.
  - \*Coordinate any revised verification times with the supervisor prior to reporting to the work area.
  - \*Follow Air Force prescribed procedures when reporting to a "Restricted Area."
2. [Weigh/Measure]
  - \*Weigh the object and/or measure the force required to perform the activity on the object.
  - \*Record the weight/force on the worksheet.
3. Weigh/measure all available objects mentioned during the interview which do not have an actual weight/force.
  - \*Emphasize those objects associated with tasks designated as top five and/or "Z".
4. Weigh/measure all available objects mentioned in prior interviews which do not have an actual weight/force.
  - \*Annotate to insure proper posting to the master worksheets.
5. Weigh/measure other significant objects which are not recorded on the worksheets.
  - \*Record a discrete description of the object.
  - \*Have the supervisor task relate the object at the end of the verification in the work area.
6. Any object generated task, which satisfies the definition of a Z task, should be recorded on the worksheet.
  - \*Record a discrete description of the task.
  - \*Annotate to insure proper posting to the AFSC Master Task List.
7. Photograph any significant task/activity being performed or the use of any interesting handling equipment.
  - \*Emphasize those task/activities which involve top five or "Z" tasks, unusual postures, or confined working space.
  - \*Note: Cameras must be registered when you check in at the security station at the front gate of the base. Under no circumstances will a camera be taken into a "Restricted Area".
8. Obtain copies of any pertinent tech orders (weight section only) and/or directives.
  - \*The base tech order publications (or quality control) office is the best source.
  - \*Transcribe all needed information to the worksheets.
9. Accomplish as much of the required consolidation of verification review trip data as possible before returning home.

#### E. POST TRIP

1. The responsible team member will complete all required consolidation of verification review trip data no later than one week after returning.
  - \*Record the number of activity and strength/stamina entries in the totals section of each Interview Sheet.
  - \*Transcribe necessary information from the Interview Sheets to their corresponding worksheets.
2. Each team member should submit all completed Interview Sheets, worksheets and supporting information to the team coordinator for review of completeness and correctness.
3. The team coordinator is responsible for posting/updating all project records and files.
  - \*Trip schedule data - trip number, trip dates, team members, and supervisors (AFSC, grade, and last name) interviewed.
  - \*Trip folder - trip number, base/location, CBPO contact (grade, name and telephone number), base information, and verification review interview schedule sheet, letters of appreciation list (trip number, grade, name, title, and address of individuals to receive letter of appreciation).
  - \*AFSC summary - supervisor (number, grade, last name, major command, and base) interviewed, task ranking (by supervisor), critical tasks (by supervisor).
  - \*Supervisor roster - trip number, K number, AFSC, supervisor, number, grade, name (last, first, m.i.), base/location, major command, years experience in AFSC, and telephone number.
4. The team coordinator should submit all trip information to the verification manager.
5. The verification manager is responsible for closing out all posting/updating of verification review trip data.
  - \*Designate an individual to update master worksheets.
  - \*Provide mailing information to Lt. Col. Maureen Lofberg, AFAMRL, for letters of appreciation.

#### F. FINAL AUDIT AND CLOSE-OUT OF AFSC

1. The verification manager will designate an individual to perform an audit of all the data on the master worksheets when the AFSC is ready to be closed-out.
2. The auditor must reaccomplish the master worksheets in preparation for data computer entry.
  - \*Audit each line item on the master worksheet, performing a full reconciliation to the Interview Sheets and other supporting data.
  - \*Reaccomplish the master worksheets, alphabetizing by tasks.

- \*Calculate an average of the estimated weights for all line entries missing an actual weight.
  - Annotate by placing an "E" in front of the weight and circling the weight.
- \*Submit all documents to the verification manager.
- 3. The verification manager will provide a copy of the master worksheets for data computer entry and accomplish all data summaries.
  - \*Frequency distribution, task ranking (by supervisor), critical tasks (by supervisor), weighted consensus of top five and "Z" tasks, etc.
- 4. The original master worksheets will be filed in the closed-out AFSC's file.

#### G. VERIFICATION REVIEW TRIP PREPARATION

1. The verification manager is responsible for establishing initial contact.
  - \*Notify AFAMRL technical monitor's office of a planned trip at least four weeks prior to the desired base visit date.
  - \*Provide them with the name of the base, the date of the trip, and the name of the team coordinator who will be working with CBPO.
  - \*AFAMRL will provide the grade, name, and telephone number of the CBPO contact to work with in coordinating the base visit.
2. The team coordinator is responsible for coordinating the base visit.
  - \*Prepare a list of desired AFSC's to be interviewed.
  - \*Telephone the CBPO contact to confirm the availability of qualified supervisor's in the desired AFSC's. Alternate AFSC's should be provided when necessary to complete an interview schedule.
  - \*Prepare an interview schedule and coordinate it with the CBPO contact.
  - \*Assign team members AFSC's from the interview schedule and provide each team member with a copy of the schedule.
  - \*Complete all arrangements for travel authorizations, car rentals, motel reservations, etc.
  - \*Prepare trip kit - blank forms, interview instructions, Interview Information Legends, simulated tasks information, copies of required master worksheets, copy of master task list file, current X-Factor list, etc.
  - \*Calibrate the load cells.
3. Each team member is responsible for attainment of all materials required for their scheduled interviews.
  - \*Copies of required master worksheets and two copies of the task list for each scheduled AFSC.
  - \*Blank forms, Instructions for Ranking Tasks on Task List, and Interview Information Legends.

ATTACHMENTS

ATTACHMENT A

INSTRUCTIONS FOR RANKING TASKS ON TASK LIST

You are asked to rank a list of 25 representative tasks performed in your AFSC. When comparing one task against another, consider only the physical demand required to perform each task - not how frequently, or infrequently, you may perform the task.

Physical demand includes both strength and endurance. Strength and endurance are found in tasks which include heavy muscular demand, or frequent and continuous exertion of muscular effort. For example, in one task you might lift a heavy object once. In another, the weight might be lighter, but the task requires many repetitive lifts. The first example requires strength and the second endurance. Both are physically demanding tasks.

Rank the 25 tasks in order from 1 to 25, according to the physical demand required to perform each task. The task you rank number 1 should be the most physically demanding task on the list. Number 25 should be the least demanding.

If you have not performed a task, mark it NA (not applicable) and proceed to rank the remaining tasks.

If you have performed a task(s) that is not on the list but is significantly demanding (i.e., it ranks with the top five tasks you have ranked), then inform the interviewer in the discussion which follows.

Use your total experience in ranking the tasks.

Note: Security classification of this interview is "Unclassified".

# ATTACHMENT B

## RANKED TASK LIST

TASK SHEET 304X4 Ground Radio Communications K009

TASK	RANK	TASK DESCRIPTION
<u>A</u>	<u>16</u>	Remove or install power supply systems (F 193).
<u>B</u>	<u>NA</u>	Remove or install permanent type antenna systems (F 191).
<u>C</u>	<u>14</u>	Remove or install multiple channel HF power amplifiers (F 167).
<u>D</u>	<u>NA</u>	Remove or install consoles other than launch control consoles (F 189).
<u>E</u>	<u>17</u>	Remove or install single channel SSP power amplifiers (F 220).
<u>F</u>	<u>11</u>	Set up mobile communications vans for use (F 245).
<u>G</u>	<u>13</u>	Remove or install multiple channel HF transmitters (F 170).
<u>H</u>	<u>1</u>	Remove or install multiple channel or track recorder and reproducers (F 176).
<u>I</u>	<u>12</u>	Remove or install multiple channel UHF transmitters (F 181).
<u>J</u>	<u>10</u>	Remove or install multiple channel UHF power amplifiers (F 178).
<u>K</u>	<u>NA</u>	Dig trenches (L 662).
<u>L</u>	<u>4</u>	Remove or install UHF transmitters (F 235).
<u>M</u>	<u>2</u>	Set up tents or 1943 shelters (L 672).
<u>N</u>	<u>18</u>	Remove or install multiple channel UHF receivers (F 180).
<u>O</u>	<u>9</u>	Remove or install UHF transceivers (F 234).
<u>P</u>	<u>3</u>	Lay electrical or communications cables (L 664).
<u>Q</u>	<u>NA</u>	Set up bath, kitchen or sanitation facilities (L 669).
<u>R</u>	<u>7</u>	Remove or install multiple channel HF transceivers (F 169).
<u>S</u>	<u>8</u>	Remove or install UHF linear power amplifiers (F 232).
<u>T</u>	<u>6</u>	Remove or install multiple HF receivers (F 168).
<u>U</u>	<u>15</u>	Remove or install facsimile systems (F 155).
<u>V</u>	<u>5</u>	Remove or install multiple channel UHF exciters (F 177).
<u>W</u>	<u>19</u>	Deliver test equipment to material control or PMEL (E 113).
<u>X</u>	<u>20</u>	Remove or install mobile antenna systems (F 165).
<u>Y</u>	<u>21</u>	Remove or install single channel SSU transceivers (F 222).
<u>Z</u>	<u>2a</u>	Remove or install ground radio equipment in control tower facility.



# ATTACHMENT C

## INTERVIEW INFORMATION LEGEND

### ACTIVITIES

Lift/Lower	[LXX] <sup>1</sup>
Carry	[CAR]
Push/Pull	[P/P]
Torque/Turn	[T/T]
Hold/Position	[HPX] <sup>2</sup>
Climb	[CLI]
Shovel/Dig	[S/D]
Hammer	[HAM]
Other	[OTH]

### NOTES:

- 1) Requires start-to-finish range breakout.
- 2) Requires level breakout.

### RANGE/LEVEL BREAKOUTS:

F - Floor  
P - Pallet  
K - Knuckle  
W - Waist/Workbench  
S - Shoulders  
R - Reach

### POSTURES

Standing	[1]
Walking	[2]
Running	[3]
Crawling	[4]
Sitting	[5]

Kneeling	[6]
Lying	[7]
Stooping (Knees Bent)	[8]
Bent At Waist	[9]
Other	[0]

### FREQUENCIES

Daily	[D]
Weekly	[W]
Monthly	[M]
Quarterly	[Q]
Semiannually	[S]
Yearly or More	[Y]

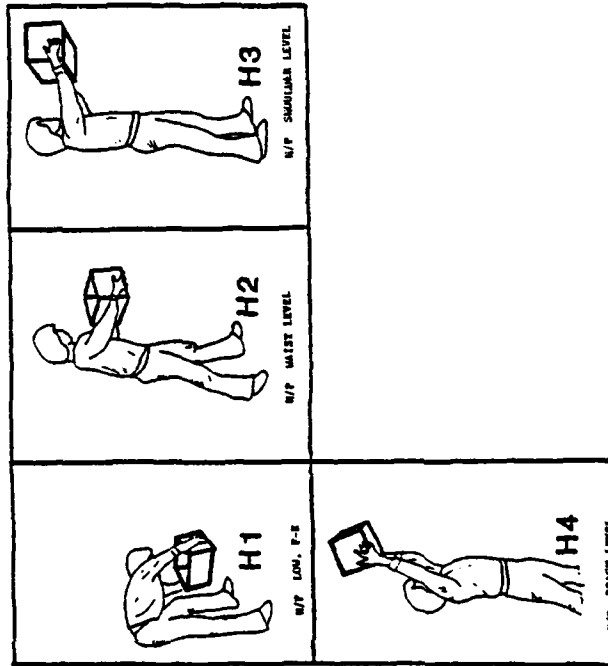
### ENDURANCE

Local	[L]
Whole Body	[W]

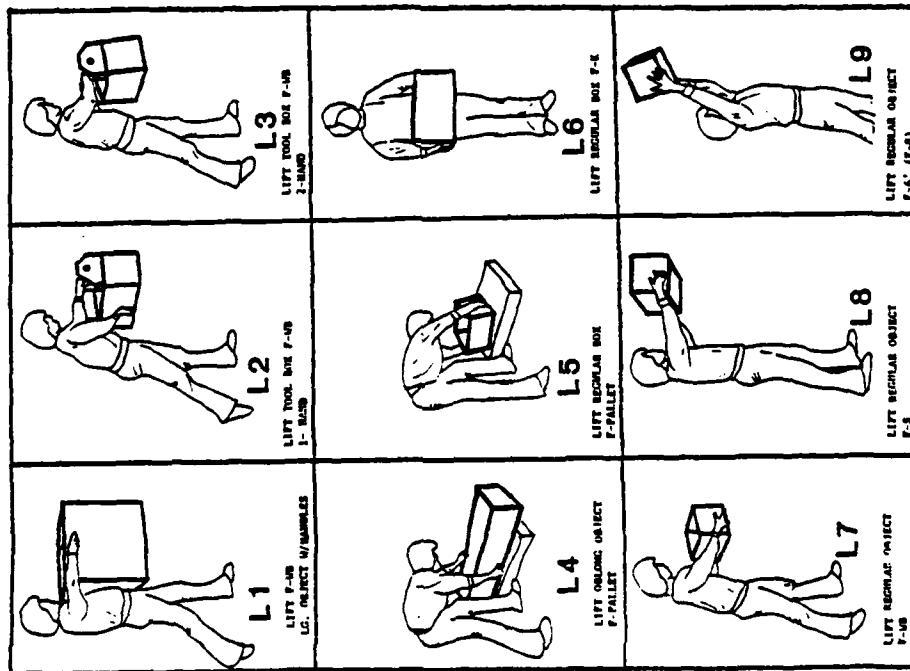
ATTACHMENT D

SIMULATED TASK INFORMATION

HOLD/POSITION



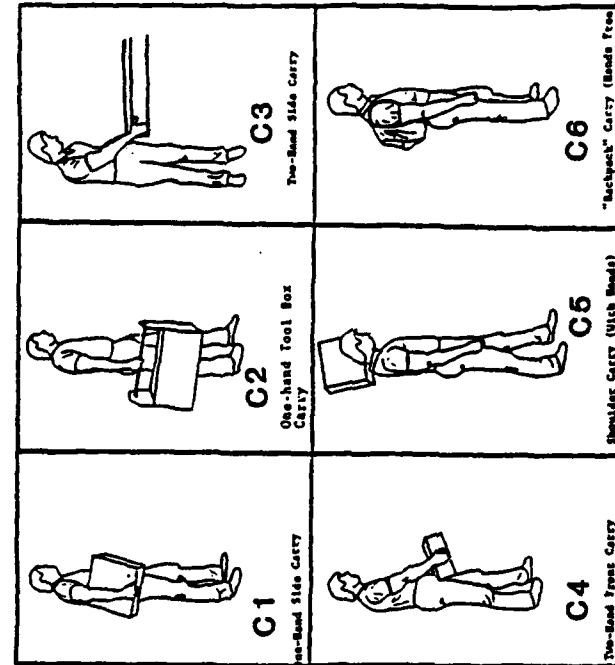
LIFT/LOWER



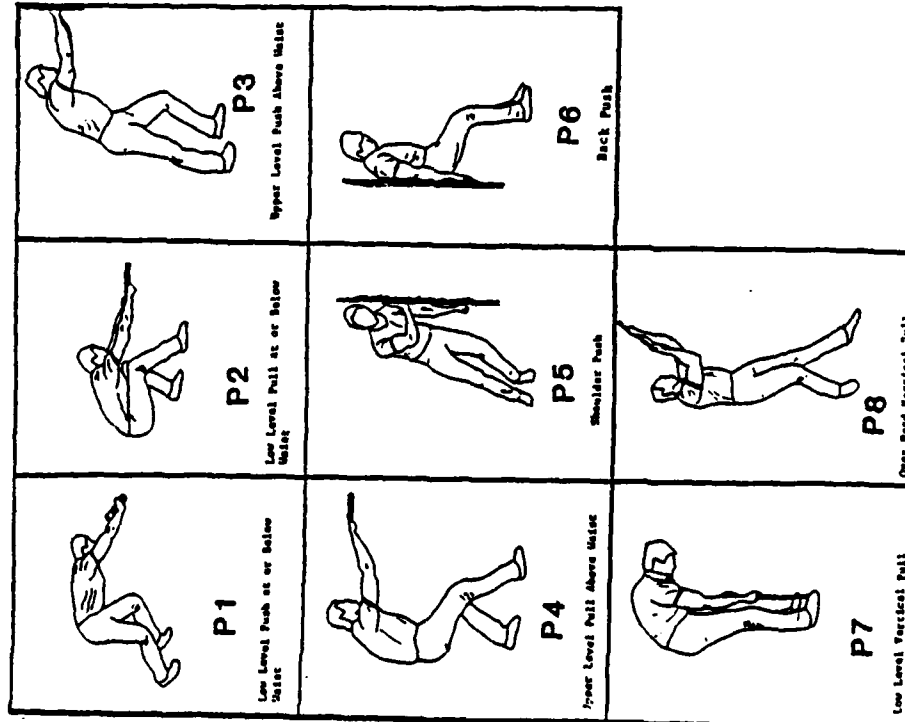
TEXAS TECH UNIVERSITY  
Institute for Biotechnology  
P.O. Box 4130 • Lubbock, Texas 79409 • 806/742-1271

Attachment D (Continued)

# CARRY



# PUSH/PULL



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Institute for Biotechnology  
P.O. Box 4110 • Lubbock, Texas 79409 • 806/743 1271

ATTACHMENT E

INTERVIEW SHEETS

Form Apvd.  
3/2/81

INTERVIEW SHEET		LAST NAME		FIRST		MI		GRADE		BASE		TRIP		MATCH		SUPV	
K #		AFSC #/TITLE		VRS. EXP.		PHONE		DATE		INTERVIEWER		X-FACTOR					
009	GROUND RADIO COMM TECHN	10	735-7611	JUL 2, 1981	DENARDO	2											
TOP 5 RANKED TASKS																	
RANK	TASK	ACTIVITY	OBJECT	POSTURE	STRENGTH	COMMENTS	ESTIMATE	FREQ.	STRENGTH	ENDUR.							
1	H	LFK	GSH 34 RECORDER/REPRODUCER, 20 CHANNEL	9	L6	LIFT AND POSITION IN EQUIPMENT RACK. BULKY PIECE, MOSTLY REPOSITIONING AROUND SHOP.	200/4P = 50	M	60	✓							
		P/P	" " "	9	P1	PUSH ALONG FLOOR, POSITIONING PIECE	350/4P = 88	M	60	✓							
2	M	LFK	1948 SHELTER BOX OF EQUIPMENT	9	L6	1948 SHELTER BOX (ROPE, ROPES, STAKES, POLES) PLACE CIRCLES IN POSITION AND INSTALL ROOF SUPPORTS, ETC.	400/6P = 65	Y	10	✓							
		CAR	" " "	1,2	C3	TENT WITH SPIKES, ROPES, ETC. TIED UP IN BUNDLE (2 MAN TENT).	200/2P = 65	Y	10	✓							
		HFK	6 MAN TENT, PACKED BUNDLE	1	H2			Y	15	✓							
3	P	P/P	487L CABLE, 100' LENGTH	9	P2	PULL OUT OF REEL IN SECTIONS. PULLING EXTENDED LENGTHS, 20' OR MORE, ALONG THE GROUND IS HARDEST, ESPECIALLY AT SITES (ROUGH TERRAIN, CLIMATIC IMPACTS)	75	M	40	✓							
4	L	CAR	MULTIPLE CHANNEL, UHF EXCITER	1	C4	LOWER EQUIPMENT AND CARRY TO AND FROM TRUCK, OFTEN UP/DOWN STAIRS.	50	N	50	✓							
		LKF	" " "	1	L6	LOWER EQUIPMENT FROM RACK.	50	N	50	✓							
5	V	CAR	MULTIPLE CHANNEL, UHF EXCITER	1	C4	LOWER EQUIPMENT AND CARRY TO AND FROM TRUCK, OFTEN UP/DOWN STAIRS.	50	N	50	✓							
		LKF	" " "	1	L6	LOWER EQUIPMENT FROM RACK.	50	N	50	✓							

## Attachment E (Continued)

TASK	ACTIVITY	OBJECT	POSTURE	STRENGTH	COMMENTS	ESTIMATE WT/PP - SHARE	FREQ.	% PART	STRENGTH	ENDUR.
22 NA										
23 NA										
24 NA										
25 NA										
26 Z	CAR LFR CLI	(ALL ABOVE UHF & VHF EQUIPMENT)	2 91 2	C4 L6 *	TASK REQUIRES ENDURANCE; WALKING/ CLIMBING 3-4 FLIGHTS OF STAIRS; CARRYING EQUIPMENT FOR SEVERAL TRIPS... AS MANY AS 8	(AS ABOVE)	11 11 11	60 60 60	11 11 11	11 11 11
<b>TOTALS:</b> 1. LIFT/LOWER (LXX) 17 CARRY (CAR) 16 PUSH/PULL (P/P) 3 2. TORQUE/TURN (T/T) 1 HOLD/POSITION (HPX) 2 CLIMB (CL1) 1 SHOVEL/DIG (S/D) 1 HAMMER (HAM) 1 STRENGTH (S) 21 ENDURANCE (E) 4										

REMARKS: TXG LEIGH HAS TASK LIST AND WILL GET TECH ORDER DATA FOR WHOLE FAMILY OF EQUIPMENT, BY TASKS.  
 CRITICAL TASKS: ALL TASKS DEALING WITH UNITS 60-50-40-30; UFT/LOWER AND CARRY ACTIVITIES.  
 TECH ORDERS AVAILABLE AND USED FREQUENTLY BY ALL ASSIGNED TO THIS AFSC.  
 FEMALES: HANDLE MOST TASKS WELL; USUALLY GOOD TECHNICIANS; MEN PROTECT THEM AT TIMES.  
 INSTALLING/REMOVING EQUIPMENT FROM FLIGHT LINE TOWER GENERALLY TOUGHEST; ENDURANCE CLIMBING 3 FLIGHTS  
 OF STAIRS; ALSO SITE ACTIVITIES (WORKING IN WINTER - SNOW, ROUGH ACCESS; SUMMER - HEAT, BUGS, ROUGH ROADS.  
 ANDREWS AFB - HAS HEAVY EQUIPMENT ASSOCIATED WITH VIP AND COMMAND OPERATIONS ROOMS; AND SITE  
 AT DAVIDSONVILLE (NEAR ANNAPOLIS, MARYLAND)  
 SITES: CARRY (HIKE) IN GEAR 1-2 MILES IN SNOW OR ROUGH TERRAIN - REQUIRES ENDURANCE.  
 PERSONNEL IN THIS AFSC UTILIZE TECH ORDERS FREQUENTLY IN THEIR JOB AND HAVE EXCELLENT KNOWLEDGE OF  
 EQUIPMENT WEIGHTS.

VERIFICATION: Building 1248 Contact TXG 1144 Telephone 735-544 Day/Time MFD 1330

ATTACHMENT F  
WORKSHEET

Form Apvd.  
3/2/81 ~~mmf~~

WORKSHEET		K 007		AFSC 30414		TITLE GROUND RADIO		Page 1 of 10	
TASK	ACTIVITY	OBJECT	POSITION	SIMUL. TASK	FREQ	Z PART	ACTUAL	ESTIMATE	REMARKS
A	LFK	PP-697B/F POWER SUPPLY	0,1	L6	U,N	30,60	02	175 175 2P 88	175 175 2P 88
A	CAR	PP-697B/F POWER SUPPLY	2	C 4	U,N	30,60	02	175 175 2P 88	175 175 2P 88
A	LFK	PP-697I/F POWER SUPPLY	0,1	L6	U,N	30,60	05	175 175 2P 88	175 175 2P 88
A	CAR	PP-697I/F POWER SUPPLY	2	C 4	U,N	30,60	05	175 175 2P 88	175 175 2P 88
A	LFK	SB 270 POWER SUPPLY	0,1	L6	U,N	30,60	05	175 175 2P 88	175 175 2P 88
A	CAR	SB 270 POWER SUPPLY	2	C 4	U,N	30,60	05	175 175 2P 88	175 175 2P 88
B	LFK	CU-547 ANTENNA COUPLER	0,1	L6	M,M	30,40	45	175 175 2P 88	175 175 2P 88
B	CAR	CU-547 ANTENNA COUPLER	2	C 3	M,M	30,40	45	175 175 2P 88	175 175 2P 88
C	LFK	MULTIPLE CHANNEL HP POWER AMP	1	L6	D,D,N	60,60,60	05	175 175 2P 88	175 175 2P 88
C	CAR	MULTIPLE CHANNEL HP POWER AMP	2	C 4	D,D,N	60,60,60	05	175 175 2P 88	175 175 2P 88
E	LFK	PRC-153 MULTIPLE CHANNEL HF TRANSMITTER	1,1	L6	D,D	30,60	30	175 175 2P 88	175 175 2P 88
E	CAR	PRC-153 MULTIPLE CHANNEL HF TRANSMITTER	2	C 4	D,D	30,60	30	175 175 2P 88	175 175 2P 88
E	LFK	SINGLE POWER 550 POWER AMP (30L-1)	1,1	L 2	D,D,D	30,60,60	30	175 175 2P 88	175 175 2P 88
E	CAR	SINGLE POWER 550 POWER AMP (30L-1)	2	C 2	D,D,D	30,60,60	30	175 175 2P 88	175 175 2P 88
E	LFK	SINGLE POWER 550 POWER AMP (30S-1)	1,1	L6	D,D	30,60	165	175 175 2P 88	175 175 2P 88
E	CAR	SINGLE POWER 550 POWER AMP (30S-1)	2	C 3	D,D	30,60	165	175 175 2P 88	175 175 2P 88

ATTACHMENT G

INTERVIEW AND VERIFICATION ASSIGNMENT SCHEDULE

INTERVIEW & VERIFICATION ASSIGNMENT SCHEDULE				Base NELLIS AFB, NEV.		Dates JUL 20-24, '81		TIME 1500	
TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY				
0830	K 74 DENARDO 413X4 SSG CIPJF	K 80E 462X0E (F-15) SSG E... DENARDO	K 80C 462X0C (A-10) SSG... DENARDO	K 73 423X3 TSG WA... DENARDO	K 119 324X0 SSG... REEDER				
	K A-24C REEDER 326X4C (F-16) TSG... SIMPSON	K 23-1X 431X1E (F-15) TSG... REEDER	K 121C 326X0C (F-4) SSG... REEDER	K 79 461X0 SSG... REEDER	K 73 DENARDO				K 120 SIMPSON
	K 168B SIMPSON 326X7B (F-15) SSG... SIMPSON	K 167C 326X4C (F-16) TSG... SIMPSON	K 80E 462X0E (F-15) SSG... SIMPSON	K 59 328X1 SSG... SIMPSON	K 73 DENARDO				K 120 SIMPSON
	K A-23B 326X3B (F-15) TSG... DENARDO	K 80F 462X0F (F-16) SSG... DENARDO	K 118 321X2 (F-16) TSG... DENARDO	K 69 321X0 TSG... DENARDO	K 121D 326X0D SSG... SIMPSON				
1030	K A-24B 326X4B (F-15) SSG... REEDER	K 168C 326X7C (F-16) TSG... REEDER	K 121C 326X0C (F-4) SSG... REEDER	K 169B 326X8B (F-15) SSA... REEDER	K 69 DENARDO				K 169B REEDER
	K A-25B 326X5B (F-15) TSG... SIMPSON	K 168C 326X7C (F-16) TSG... SIMPSON	K 80C 462X0C (A-10) TSG... SIMPSON	K 110 325X0 SSG... SIMPSON	K 69 DENARDO				K 169B REEDER
	K 79 DENARDO 461X0 SSA... SIMPSON	K 80D 462X0D (F-4) TSG... DENARDO	K 15C 322X2C SSG... SIMPSON	K 81 463X0 TSG... REEDER	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
1300	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
1500	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON
	K 168 SIMPSON A-24C REEDER	A-25B SIMPSON K 23-1X REEDER	K 80F DENARDO K 121C REEDER	K 118 DENARDO K 59 SIMPSON	K 119 REEDER				K 121D SIMPSON

\* VERIFICATION IN WORK AREA

ATTACHMENT H  
SUPERVISOR ROSTER

SUPERVISOR ROSTER			Trip # 30		Team: DENAROO, REEDER, SIMPSON		Jul 20-24, 1981		
K I	AFSC	S I	GRADE	NAME (LAST, FIRST, MI)	BASE	NELLIS AFB, NEV	NATCOM	YEARS EXPR	PHONE NUMBER
15-C	3222C	3	MSG	R. C. S. L. C. Y. C.	"	"	TAC	21	(702) 643-5503
23-IX	4317I	30	TSG	STANLEY, R. C.	"	"	"	10	" " - 1362
A-23	32673	1	TSG	PAUL, PETER S.	"	"	"	11	" " 3715
A-23	32673	2	Ssg	TOA JAMES, R. O. A. D. E.	"	"	"	2	" " 3715
A-24	32674	2	TSG	M. C. F. F. F. E. A. R.	"	"	"	10	" " 4702
A-24	32674	1	Ssg	LOFT, J. L. V.	"	"	"	3	" " 4502
A-25	32615	1	TSG	P. S. E. R. W. I. E. M. S.	"	"	"	5	" " 4311
59	32851	2	SRA	W. C. H. E. S. R. I. K. A. N. D. A.	"	"	"	3	" " 4353
64	39210	4	TSG	W. A. R. E. N. C. I. E.	"	"	"	4	" " 4097
73	42373	3	TSG	W. A. R. E. N. C. I. E.	"	"	"	18	" " 116
74	42374	6	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	8	" " 1645
79	46190	1	SMS	C. H. S. E. A. L. L. I. E.	"	"	"	18	" " 2950
79	46190	2	MSG	C. H. S. E. A. L. L. I. E.	"	"	"	6	" " 2150
80	46270	2	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	9	" " 2611
80	46270	3	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	7	" " 2611
80	46270	4	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	9	" " 2611
80	46270	5	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	13	" " 2611
80	46270	6	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	10	" " 2611
80	46270	7	SMS	C. H. S. E. A. L. L. I. E.	"	"	"	16	" " 2611
81	46370	1	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	18	" " 2611
118	34172 Pk	1	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	15	" " 412
119	32470	7	MSG	C. H. S. E. A. L. L. I. E.	"	"	"	6	" " 2573
120	32570	3	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	10	" " 1511
120	32570	4	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	11	" " 2511
121-D	32670D	3	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	7	" " 4212
121	32670	4	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	4	" " 2611
167	32670	1	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	15	" " 4212
168	32677	1	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	4	" " 2611
168	32677	2	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	3	" " 4212
168	32657	3	Ssg	C. H. S. E. A. L. L. I. E.	"	"	"	1	" " 2611
168	32657	4	TSG	C. H. S. E. A. L. L. I. E.	"	"	"	13	" " 4212
169	32658	1	SRA	C. H. S. E. A. L. L. I. E.	"	"	"	3	" " 2611

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ATTACHMENT I  
TRIP SCHEDULE SHEET

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ATTACHMENT J  
CONTENT OF TRIP KIT

BLANK FORMS

- \* Interview Sheets
- \* Worksheets
- \* Task lists (2 copies for each AFSC scheduled for interview)
- \* Instructions for Ranking Tasks on Task List

WORKSHEETS

- \* Master Worksheet (copy for each AFSC scheduled for interview)

MASTER TASK LIST FILE

TRIP FOLDER

- \* Annotate with Base/Location, Dates, Trip, #, CBPO contact name and phone number, Motel and travel information, etc.
- \* Interview and Verification assignment Schedule
- \* Trip Schedule Sheet
- \* Base Map












GENERAL FORMS










- \* Simulated Tasks Information
- \* Physical Profile Serial Factor "X" (listed in AFR 160-43)
- \* AFAMRL/HEG Letter: Physical Job Requirements Review for the New Factor X Program
- \* Verification Review Procedures
- \* Interview Information Legend

# ATTACHMENT K

## GENERAL INFORMATION

### AIR FORCE ENSIGNIA

OFFICERS										
0-1	0-2	0-3	0-4	0-5	0-6	0-7	0-8	0-9	0-10	SPECIAL
										
2LT	1LT	CPT	MAJ	LTC	COL	B/G	M/G	L/G	GEN	

ENLISTED								
E-1	E-2	E-3	E-4	E-5	E-6	E-7	E-8	E-9
								
A/B	AMN	A/C	SGT SRA	SSG	TSG	MSG	SMS	CMS

### MAJOR COMMANDS (MAJCOM)

TAC TACTICAL AIR COMMAND  
 MAC MILITARY AIRLIFT COMMAND  
 SAC STRATEGIC AIR COMMAND  
 ATC AIR TRAINING COMMAND  
 AFSC AIR FORCE SYSTEMS COMMAND  
 AFLC AIR FORCE LOGISTICS COMMAND  
 AFCC AIR FORCE COMMUNICATIONS COMMAND  
 AAC ALASKAN AIR COMMAND  
 PACAF PACIFIC AIR FORCES

APPENDIX B

Example of AFSC Summary and Frequency Distribution Chart

K 119 AFSC: 324X2 Title: Precision Measuring Equip

Supv's Wt	Top-5 Ranking Order					Activities Count								End.
	1	2	3	4	5	L/I	CAR	P/P	H/P	T/I	C/I	S/O	MM	
S1	E	J	D	X	O	15	2	2	—	2	1	—	2	
S2	E	D	C	A	O	6	3	4	—	—	—	—	0	
S3	C	H	J	G	K	17	6	3	1	—	—	—	1	
S4	D	A	G	H	L	22	3	2	—	1	—	—	2	
S5	A	K	Z	G	I	15	4	7	1	1	—	—	9	
S6	Z	D	F	A	A	20	2	2	—	1	—	—	4	
S7	I	J	G	D	O	19	2	2	—	1	—	—	6	
S8	—	—	—	—	—	—	—	—	—	—	—	—	—	
S9	—	—	—	—	—	—	—	—	—	—	—	—	—	
S10	—	—	—	—	—	—	—	—	—	—	—	—	—	
S11	—	—	—	—	—	—	—	—	—	—	—	—	—	
S12	—	—	—	—	—	—	—	—	—	—	—	—	—	
S13	—	—	—	—	—	—	—	—	—	—	—	—	—	
S14	—	—	—	—	—	—	—	—	—	—	—	—	—	
S15	—	—	—	—	—	—	—	—	—	—	—	—	—	
Totals						114	23	25	2	5	1	3	24	

# AFSC SUMMARY

Worksheets completed  
by: L. Cohen  
on: 18 Sep, 81

Worksheets submitted  
for computer input  
on: 20 Sep, 81

Worksheets updated  
on: —

## Remarks:

AFSC closed out.  
Evaluate as candidate  
for upgrading to X-1.  
Actuals for all tasks.

Current Factor 'X'..... X-2

Total # of Supervisors.... 7

Tasks Measured

Actuals..... 34

Estimates..... —

Total..... 34

Activities

Primary..... LA

Secondary..... PF

Tertiary..... CAR

Endurance

Average #..... 3 1/2

Yes/No..... No

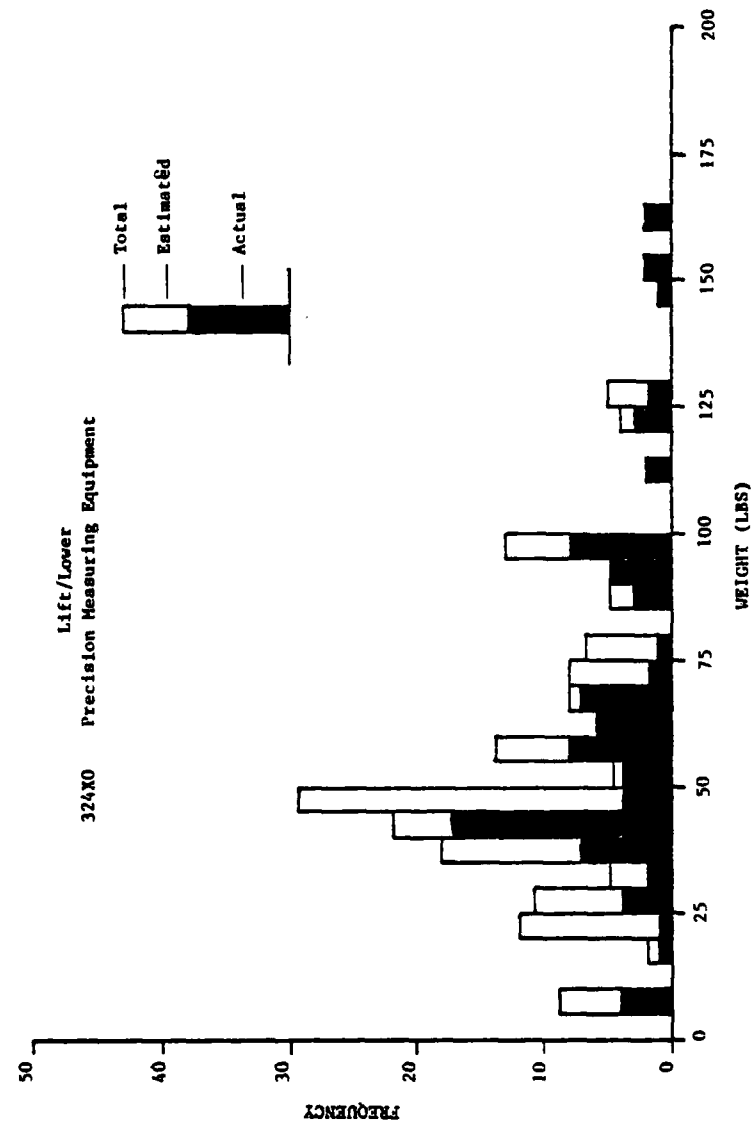
Strength Index(s<sub>n</sub>).....

E	G	B	D	15	A	12	Z	3	5	4	H	6	B	9	25	3	4	2	X	2
10																				

Weighted Order of Top - 5 Ranked Tasks														
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th
D	A	E	G	C	D	H	Z	I	K	L	Z	J	F	X

Task Coverage														
Act.	A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15													
Est.														
None														

FREQUENCY DISTRIBUTION



APPENDIX C

Sample of AF Jobs Common to Other Services

SAMPLE OF AF JOBS COMMON TO OTHER SERVICES

115X0	Pararescue & Recovery	431X0	Helicopter Maintenance
203X0	Linguist/Interrogator	431X1	Tactical Aircraft Maintenance
205X0	Electronic Intell. Oper.	461X0	Munitions Systems
231X0	Audio Visual Media	462X0	Aircraft Armament System
242X0	Disaster Preparedness	463X0	Nuclear Weapons
251X0	Weather	464X0	Explosive Ordinance Disposal
272X0	Air Traffic Control	472X0	Base Vehicle Equipment Mtn.
293X0	Ground Radio Operator	472X2	General Purpose Vehicle Mtn.
302X0	Weather Equipment	472X3	Vehicle Body Maintenance
303X0	Auto Tracking Radar	511X0	Computer Operations
304X4	Ground Radio Communications	542X1	Electrical Power Line
304X5	Television Equipment	545X0	Refrigeration & Cryogenics
316X1	Missile System Maintenance	545X2	Heating Systems
321X2	Weapons control System	551X0	Pavements Maintenance
324X0	Precision Measuring Equip.	551X1	Construction Equipment
325X0	Auto Flight Control Sys.	552X0	Carpentry
326X7	Int. Avionics Instrm & Fit. Con. Sys.	552X1	Masonry
341X1	Instrumen Trainer	552X2	Metal Fabricating
341X3	Analog Flight Simulator	552X4	Protective Coating
341X4	Digital Flight Simulator	552X5	Plumbing
361X1	Cable Splice Install & Mtn.	566X0	Entomology
362X4	Tele. Equip. Install & Rep.	571X0	Fire Protection
423X0	Aircraft Electri. Systems	591X0	Seamen
423X2	Aircraft Egress Systems	591X1	Marine Engine
423X3	Aircraft Fuel Systems	602X1	Freight Traffic
423X5	Aerospace Ground Equip.	602X0	Passenger & House Hold Goods
426X2	Jet Engine	612X0	Meatcutter
427X0	Machine Shop	631X0	Fuel Service
427X1	Corrosion Control	645X0	Supply Systems
427X3	Fabrication & Parachute	811X2	Law Enforcement
427X4	Metals Processing	99505	Courier
		.....	and <u>many</u> other!



